

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Previously Presented) A method for manufacturing a hollow rack shaft comprising:

a first step for forming a substantially flat and rectangular plate workpiece into a gutter-like shaped workpiece, said gutter-like shaped workpiece having a flat bottom portion, a pair of semi-circular bottom portions extending from each longitudinal side of said flat bottom portion, and a pair of leg-like side walls extending upwardly in parallel from each lateral side of said flat bottom portion and said semi-circular portions;

a second step for forming a row of rack teeth on said flat bottom portion of said gutter-shaped workpiece; and

a third step for forming said workpiece into a hollow shape by bending said leg-like side walls by butting edges of said walls to each other;

wherein a pressing surface of a pair of dies used in said first step is inclined in a longitudinal direction of said workpiece relative to a pressing surface of a second pair of dies used in said first step so as to cancel elastic recovering of said workpiece when said workpiece is removed from said die set.

2. (Currently Amended) A method for manufacturing a hollow rack shaft comprising:

a first step for forming a substantially flat and rectangular plate workpiece into a gutter-like shaped workpiece, said gutter-like shaped workpiece having a flat bottom portion, a pair of semi-circular bottom portions extending from each longitudinal side of

said flat bottom portion, and a pair of leg-like side walls extending upwardly in parallel from each lateral side of said flat bottom portion and said semi-circular portions;

a second step for forming a row of rack teeth on said flat bottom portion of said gutter-shaped workpiece; and

a third step for forming said workpiece into a hollow shape by bending said leg-like side walls by butting edges of said walls to each other;

wherein a die set used in said second step provides a complementary surface to a row of rack teeth formed on said flat bottom portion and said die set includes a first pair of dies and a second pair of dies having a difference in pressing angle suitable to cancel longitudinal elastic recovering of said workpiece when said workpiece is removed from said die set.

3. (Previously Presented) A die set used in a method for manufacturing a hollow rack shaft, said method comprising;

a first step for forming a substantially flat and rectangular plate workpiece into a gutter-like shaped workpiece, said gutter-like shaped workpiece having a flat bottom portion, a pair of semi-circular bottom portions extending from each longitudinal side of said flat bottom portion, and a pair of leg-like side walls extending upwardly in parallel from each lateral side of said flat bottom portion and said semi-circular portions;

a second step for forming a row of rack teeth on said flat bottom portion of said gutter-shaped workpiece; and

a third step for forming said workpiece into a hollow shape by bending said leg-like side walls by butting edges of said walls to each other;

wherein a die set used in said second step provides a complementary surface to said semi-circular bottom portion and a pressing surface of a pair of dies is inclined in a longitudinal direction of said workpiece relative to a pressing surface of a second pair of dies used in said first step so as to cancel elastic recovering of said workpiece when said workpiece is removed from said die set.

Y
longitudinal?

4. (Currently Amended) A die set used in a method for manufacturing a hollow rack shaft, said method comprising;

a first step for forming a substantially flat and rectangular plate workpiece into a gutter-like shaped workpiece, said gutter-like shaped workpiece having a flat bottom portion, a pair of semi-circular bottom portions extending from each longitudinal side of said flat bottom portion, and a pair of leg-like side walls extending upwardly in parallel from each lateral side of said flat bottom portion and said semi-circular portions;

a second step for forming a row of rack teeth on said flat bottom portion of said gutter-shaped workpiece; and

a third step for forming said workpiece into a hollow shape by bending said leg-like side walls by butting edges of said walls to each other;

wherein a die set used in said second step provides a complementary-surface to a row of rack teeth formed on said flat bottom portion and said die set includes a first pair of dies and a second pair of dies having a difference in pressing angle suitable to cancel longitudinal elastic recovering of said workpiece when said workpiece is removed from said die set.

Claims 5-14 (Canceled).

15. (Currently Amended) A method of manufacturing a hollow rack shaft, which comprises:

pressing a first portion of a workpiece between a first pair of dies, including a first upper die and a first lower die, and a second portion of the workpiece between a second pair of dies, including a second upper die and a second lower die, to form a pressed workpiece,

wherein each of the first and second pairs of dies extends in a same longitudinal direction,

wherein a cross-section of the pressed workpiece includes a first substantially straight section formed by said first pair of dies and a second substantially straight section formed by said second pair of dies, said first and second sections both extending in said longitudinal direction somewhat in parallel with each other, and

wherein said cross-section is taken along a plane that extends in said longitudinal direction; and

prior to the step of pressing, forming pressing surfaces of the first and second pairs of dies such that a cross-section of the pairs of dies taken along said plane includes a predetermined angle between said pressing surfaces such that said pressing surfaces are non-parallel with each other in order to cancel longitudinal elastic recovering of said workpiece. ~~other.~~

16. (Previously Presented) A method according to claim 15, further comprising:

adjusting the predetermined angle based on the workpiece material. ^a

17. (Previously Presented) A method according to claim 15, further comprising:

adjusting the predetermined angle based on the workpiece size. ^b

^c 18. (Previously Presented) A method according to claim 15, further comprising:

adjusting the predetermined angle based on the workpiece thickness. ^c

19. (Currently Amended) A method of manufacturing a hollow rack shaft, which comprises:

pressing a workpiece between a central pair of dies and an outer pair of dies on each end of the central pair of dies to form a pressed workpiece,

wherein each of the pairs of dies extends in a same longitudinal direction,

wherein a cross-section of the pressed workpiece includes a first substantially straight section and a second substantially straight section, said first and second sections both extending in said longitudinal direction somewhat in parallel with each other, and

wherein said cross-section is taken along a plane that extends in said longitudinal direction,

wherein said first section is formed between one of the outer pair of dies, and said second section is formed between the other one of the outer pair of dies; and

prior to the step of pressing, forming pressing surfaces of the outer pairs of dies

such that, during said step of pressing, a cross-section of the outer pairs of dies taken along said plane includes an angle between said pressing surfaces such that said pressing surfaces are non-parallel with each other in order to cancel longitudinal elastic recovering of said workpiece. ~~other.~~

20. (Previously Presented) A method according to claim 19, wherein the central pair of dies forms a substantially flat central surface.

21. (Previously Presented) A method according to claim 19, wherein the central pair of dies forms a corrugated surface.

22. (Currently Amended) A method of manufacturing a hollow rack shaft, which comprises:

pressing a first portion of a workpiece between a first pair of dies to form a first substantially straight section, and a second portion of the workpiece between a second pair of dies to form a second substantially straight section,

wherein the first and second pairs of dies extend in a longitudinal direction, and wherein said first and second sections extend in said longitudinal direction somewhat in parallel with each other; and

prior to the step of pressing, forming pressing surfaces of the first and second pairs of dies such that said pressing surfaces are non-parallel with each other in order to cancel longitudinal elastic recovering of said workpiece. ~~other.~~
